

Approach for Constructing Chatbots About Government HR Policies

Here, we summarize a research study focused on how to harness the power of NLP methods to construct chatbots that answer questions about HHS HR policy. For more information about this study, explore and follow the author's Github at <https://github.com/Steve-Desilets> or email him at steve.desilets27@gmail.com.

Research Objectives

Leverage Natural Language Processing (NLP) Methods to Advance the Accuracy and Efficiency of HR Service Delivery at the Department of Health and Human Services (HHS).

Identify Chatbot Development Best Practices that Could Help Other Government Human Resources (HR) Offices.

Methodology

We measured the speed and accuracy of six types of chatbot models when answering questions about the HHS HR Policy Library.

1) Sentence-Based Transformer Model

4) DistilBERT Model

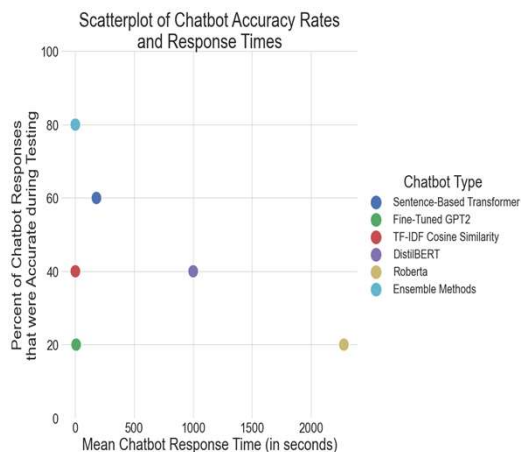
2) Fine-Tuned GPT2 Model

5) Roberta Model

3) TF-IDF Cosine Similarity Model

6) Ensemble Methods Model

Results



The Ensemble Methods Model outperformed the other models when measuring the accuracy and speed of its responses.

Thoughtful model design choices appear to reduce the risk of the generative models hallucinating or leveraging context external to the corpus by as much as 80 percentage points (in scenarios where users ask off-topic questions).

Conclusions

Ensemble Methods Chatbots Can Deliver Accurate Answers to HR Specialists Quickly

Model Design Choices and Testing can Reduce the Risk of Models Hallucinating or Leveraging External Context

Recommendations

Implement Ensemble Methods Chatbots for other Governmental HR Offices

Try More Chatbot Development Methods

Research How To Improve Existing Chatbots